BAYLEY

* * * * * * * * * * * * * * * *

An Inaugural Dissertation on the

WM-RC206
B34

M-RC 206 B34

Columbia University
in the City of New York

College of Physicians and Surgeons

Library

Digitized by the Internet Archive
in 2011 with funding from
Open Knowledge Commons

http://www.archive.org/details/inauguraldissert00bayl

AN

INAUGURAL DISSERTATION

ON THE

ORIGIN AND PROPAGATION

OF THE

YELLOW FEVER.

SUBMITTED TO THE PUBLIC EXAMINATION OF THE

FACULTY OF PHYSIC

UNDER THE AUTHORITY OF THE

TRUSTEES OF COLUMBIA COLLEGE,

IN THE

STATE OF NEW-YORK;

The Right Rev. BENJAMIN MOORE, D. D. President;

FOR THE DEGREE OF

DOCTOR OF PHYSIC,

ON THE 4th OF MAY, 1802.

By JOSEPH BAYLEY.

NEW-YORK:

Printed by T. & J. Swords, Printers to the Faculty of Physic of Columbia College.

1802.

D^r Valentine Seamen

from his most Obedient

and very humble Serv^t

the Author

SPEC COLL
M COLL
RC
206
.B34
1802

TO

Doctor WRIGHT POST,

Professor of Anatomy and Surgery in Columbia College.

PERMIT me to offer my sincere acknowledgments for the attention you was pleased to show me while I studied under your care; the remembrance of which will always afford the highest satisfaction to your grateful and much obliged pupil,

JOSEPH BAYLEY.

TO

Doctor ISAAC LEDYARD,

Health Officer;

Doctor JAMES TILLARY,

Resident Physician;

AND

Doctor EDWARD MILLER,

Health Commissioner:

THIS Dissertation is most respectfully dedicated, in grateful testimony of the numerous favours conferred on their much obliged and very humble servant,

The AUTHOR.

AN

INAUGURAL DISSERTATION

ON

YELLOW FEVER.

A Dangerous and often fatal disease, which is now generally called Yellow Fever, has excited a high degree of public attention throughout the United States of America, ever since the year 1793. Although the features of this disease are very strong, and in most cases easily to be distinguished from every other complaint, medical men of the first reputation are not agreed to this hour, whether it is to be considered as a native of our own country, or the production of a foreign climate, imported, like other exotics, from year to year, and living or thriving only so long as it can be cherished by a warm or temperate atmosphere. It has happened in

this instance, as it has frequently in others, that the advocates for the opposite opinions have each been so zealously attached to their own mode of viewing the question, that a proper attention has not been given to facts, and the arguments naturally deducible from those facts, which, in a case of this kind, ought to be the chief ground upon which a judgment should be formed.

Considering the experience and abilities of gentlemen who have written on this subject, I can say with much truth and sincerity, "non nostrum inter *hos* tantas componere lites." But as I have for some years lived much among the unfortunate subjects of the yellow fever, and as it has been my duty to observe it in its different forms, and to inquire concerning its origin and progress, I have formed an opinion somewhat different from either of the theories that have been commonly supported; wherefore I shall venture upon the middle ground, and shall endeavour to prove that the yellow fever may be imported from foreign parts, and that it may be, and has been generated in the United States.

Considering the great importance of this subject, whoever contributes in any degree to its elucidation, may be supposed to have served the public; for there is not an individual in the United States whom this question does not concern, either as it may affect his personal safety, or his private interest. It reaches alike the merchant and the planter.

The complaint which is the subject of our present consideration is an *infectious*, not a *contagious* fever; and it may be of great importance that this distinction be well understood and uniformly observed.

Infection and *contagion* are frequently used indiscriminately to convey the same idea, or indifferently to express the same disease; but there is reason to believe that an infectious fever being mistaken for one that is contagious, has proved the source of much calamity: it has caused the sick in many cases to be deprived of the comforts and assistance that were essential to their recovery. They have been deserted by their timorous attendants, and have perished for the want of proper care.

The terms *infection* and *contagion* are pro-

perly applied to two distinct orders of diseases; and if the distinction was constantly attended to, people would become better judges of the danger to which they are exposed by remaining in cities or other places where endemical complaints are prevailing. A contagious fever is one by which we cannot be assailed more than once; but we may be assailed from time to time by an infectious fever. A contagious fever is generally and almost certainly communicated by touching, or coming near a patient who labours under that disease; but a patient who is afflicted with an infectious fever may be approached or touched with the utmost safety, provided he is surrounded by a pure atmosphere, and is furnished with clean bedding and clothes.

A contagious fever appears in every case to proceed from a fever of the same genus; but infectious fevers seem to be anomalous: their parents are not so discoverable; or, to speak more correctly, they are not begotten by fevers. A contagious fever is propagated in cold as freely as in hot weather; it spreads in a pure atmosphere, or in that which is vitiated; but the progress of infectious fevers is

arrested by cold weather, and their propagation prevented by a pure atmosphere.

Fevers that are occasioned by putrid exhalations, whether created by animal and vegetable decomposition, or by human effluvia arising from the bodies of people who are crowded in damp apartments, badly ventilated, where cleanliness is not observed, ought to be denominated *infectious*. If healthy people should venture into such places, many of them would probably be infected: but let the sick be removed and thoroughly cleansed; wash their bodies with water and soap; take away their dirty clothing, and furnish them with that which is clean; convey them to well-ventilated buildings, situated in a healthy place; furnish them with clean bedding; then an infectious fever, that much-dreaded disease, which few escape who come within its original sphere of action (the place in which it is generated) becomes in a great degree harmless, so that those whose business it is to visit and attend upon the sick may perform that duty with very little risk of being infected.

How different from this is a contagious

fever? Let a number of people with the small-pox or measles, which are *contagious* fevers, be placed under circumstances such as I have described; what would be the result? It will be admitted, I believe, that if one hundred persons who never had either of these complaints should officiate as nurses in an hospital where there were many patients with these diseases, after all the precautionary methods which could be taken, hardly one would escape the contagion.

Having stated what I consider the essential and clear distinction that is to be made between the yellow fever and those diseases which are properly called contagious, I shall endeavour to trace the origin and cause of the former. This is a question which demands the most impartial investigation, and one that claims our utmost attention; for our prejudices in favour of our native soil are liable to induce us to doubt whether so dangerous and destructive a disease can be produced among us.

It is our duty to hear and believe the truth, that, when the origin and cause are known, our efforts may be properly directed; and should the remedy be within the compass of

human exertion, it ought to be assiduously applied, until the domestic cause, if such there be, is overcome. Then we may with safety rely on rigid quarantine laws, faithfully executed, to prevent the admission of pestilential diseases from abroad; and should the disease, by accident, escape the vigilance of the Health-Officer, its baneful influence would not be very extensive.

How is the yellow fever produced, or what is the climate or country of which it is a native? Although we should not be able to find an appropriate and native soil for this child of Pandora, I have many reasons for thinking, that the popular opinion of its being always imported, is not well founded. The very countries to which this fever has been attributed deny its originating there, and perhaps with the same propriety as we do. Since, then, all disclaim it, and since it cannot be traced to any place in particular, let us candidly examine the causes to which it has been attributed, and see whether they are adequate to its production. I do not pretend to know what are the chemical combinations or mixture of airs that are produced from a large

mass of animal and vegetable matter brought into active fermentation by sufficient heat and moisture, but the effects of those combinations have been severely felt; they have produced fevers from the lowest to the highest grades, according to the activity and continuance of the pestilential gases, and the liability of the body to receive infection. Such, invariably, will be the result of animal and vegetable putrefaction in all those countries where the solar heat is sufficiently powerful, and the inhabitants predisposed to febrile complaints.

The East and West-Indies, some parts of Europe, the coast of Africa bordering on the Mediterranean, crowded ships on long voyages, and our own country, afford recent and lamentable proofs of the local origin of infectious fevers. Witness the summer and fall of the year 1798, which were unusually sultry. There was scarce a seaport along the coast of the United States that was not afflicted with this deadly malady, while the intermediate country was entirely exempted. Does not this fact convey sufficient evidence, that there was something particularly wrong in our cities? for many persons infected with the

cause of this fever in the towns, sickened and died in the country, and did not propagate the distemper. This circumstance alone would almost convince the unprejudiced inquirer, that the yellow fever may originate in our cities.

The most conclusive argument in favour of the domestic origin of this disease, is its total annihilation as soon as severe frost sets in; for this at once arrests the progress of putrefaction, and thereby stops the generation of pestilential airs.

In Africa and India, where frost is seldom severe, the progress of the disease is checked by the periodical rains which swell their rivers and inundate their low lands, thereby preventing the direct action of the sun upon those animal and vegetable substances which had been left by the waters retiring to their accustomed channels.

Do not these facts demonstrate the source of this malady? and do they not clearly explain its occurrence in the summer and fall months, and its disappearance at the approach of winter?

This fever generally commences with that

class of citizens who are reduced to the necessity of living in small and crowded houses, in the most unhealthy parts of the town. Strangers from a colder climate, farmers from the adjacent country, and inhabitants of the city who have breathed some time a purer atmosphere, are sooner taken down by this fever than people who live constantly in the city. They are also attacked with more violence. But it is observed that strangers from the West-Indies, a warmer climate, are less endangered by the disease than our own citizens. If it should be alleged that the inhabitants of the country are accustomed to breathe a purer air than those who dwell in cities, which is doubtless true; then it must be acknowledged that a peculiar and contaminated state of air exists in the city, which becomes daily more contaminated from the same vitiating cause, until it arrives at the degree which produces pestilence.

The West-Indies are usually sickly in time of war. Is not this to be attributed to the greater number of strangers who are there on such occasions, who are not accustomed to warm climates? for the former inhabitants

are generally as healthy then as in times of peace.

The yellow fever has appeared in the interior of this country, beyond the reach of imported contagion. Whence did it arise?

During three years residence at the Marine Hospital, I have seen many and painful demonstrations that fevers of the most dangerous nature may be produced by a contaminated atmosphere.

In the summer and autumn of 1801, several vessels arrived at this port from Ireland. In one of these vessels, which was not large, upwards of four hundred men and women were cooped up for eight or ten weeks, in the warmest season of the year; many of them without a change of clothing sufficient to keep themselves clean, and using a diet to which they had not been accustomed. All these contaminating circumstances, heightened by the indescribable languor caused by sea-sickness, whereby men become negligent of their persons, and sometimes indifferent as to their existence, produced an infectious fever among the passengers, and several of them died with the characteristic symptoms

of yellow fever, such as black vomit, livid spots, eyes highly inflamed and protruded from their sockets, and universal yellowness of the skin.

The resources of the quarantine establishment were not at that time competent to afford an asylum with all the requisite apartments for the numerous sick and distressed emigrants who arrived in the space of a few weeks; for they were three times the number that had come to the marine hospital in any former year. Hence it was that the sick were crowded together more than could be desired; whereby their recovery was retarded, and the danger to which the attendants were exposed was greatly beyond what had ever before occurred at that institution; so that of all the attendants on the health establishment, fifty-eight in number, none, except the boatmen and one washerwoman, escaped a dangerous illness; many of them were infected three or four times, and one of the nurses seven times.

The Health Officer, Doctor RICHARD BAYLEY, whose medical knowledge was particularly directed to the most useful part of

his profession; whose assiduity in alleviating the pains of the distressed, and tranquillizing the mind, was no less conspicuous than his skill in restoring the body to its accustomed vigour; whose accurate judgment was no less highly esteemed, than his benevolence distinguished for the innumerable acts of public and private good in which his talents and means were constantly engaged; this inestimable man, while executing, with scrupulous fidelity, the important trust reposed in him as guardian of the public health, caught the fatal fever which terminated his useful life. Remembrance oft recals the afflicting scene, and reminds me how much I am indebted to his parental care, who first exhibited to me the inimitable structure of the human frame; explained the various parts of the body, and the diseases to which they are liable; and showed the union and harmony of this chief and most perfect work of him, whom we cannot sufficiently adore as the author of every good.

What could have produced the prominent symptoms of yellow fever, viz. constant nausea ending in black vomit, dark-coloured

stools, protruded and highly inflamed eyes, with universal yellowness of the body, which appeared on board of the Irish ship? It was not imported from the West-Indies—It must have been the effect of a vitiated atmosphere.

Why do the seaports of Great-Britain, when such an extensive and direct intercourse is constantly kept up between them and the West-India islands, escape the yellow fever? Is it not because their climate is not sufficiently warm to corrupt the atmosphere to such a degree as to be capable of generating and propagating the fever?

The most plausible argument that has been advanced against the possibility of domestic origin, and which is by some conceived a very important one, is the circumstance of the city of New-York having been exempted from the yellow fever during the revolutionary war, at which time there was apparently more offensive matter in the city than there has been at any time since. The following solution of this objection is humbly submitted for consideration.

Heat, which is one of our greatest blessings, whose influence and effects are so essential to

our very existence, has, from ill-directed labours, been the active agent in extinguishing the vital flame which it first inspired. There is not any reason to believe that the general temperature of the atmosphere in the United States is warmer during the summer months at present than it was twenty years ago. But it will readily be perceived, that the heat of the atmosphere within the last twenty years has been very much affected in the city of New-York by the increase of brick walls and stone pavements, by which the rays of the sun are reflected and the heat greatly augmented.

In the mean time, the increased heat is not the chief cause of the late corrupted state of the atmosphere. Many acres of ground have been made, principally on the East-river, within the last twenty years; and the advantage of wholesome earth with which the first docks were made, has been, of late years, in some measure dispensed with, for it was not so cheap and easily to be procured as formerly. A considerable part of the materials with which these docks have been formed is perishable; and these huge masses of corrupting

matter are kept constantly moist by water, which penetrates into those made grounds and greatly accelerates the putrefactive fermentation. This mixture requires no other assistance than a sufficient degree of heat to volatilize and disengage its deadly gases, which the south-eastern side of the city receives from the sun, by its favourable exposure, through the greater part of the day. When the water is in larger quantity than the earth can absorb, which frequently happens, it oozes into the cellars in the most populous parts of the city, where it discharges the noxious qualities of the putrefying substances, which, in that state, become far more injurious to health than if they were exposed to the correcting power of the general atmosphere. The greater part of these immense hidden masses of corrupting materials, whose fair exterior conceals the destructive instruments of death, have been deposited since the revolutionary war.

A constant intercourse was preserved with the West-Indies during the revolutionary war, and until the year 1793; and no precaution was taken against importing infectious fevers,

until the dreadful calamity which befel Philadelphia gave us the first awful warning to guard against foreign plagues. During all that time no yellow fever raged here, although the disease existed in the West-Indies; nor did it become epidemic until 1795, although, previous to that period, there had been a few sporadic cases on the East-river yearly, when it neither was called yellow fever, nor was imported contagion thought of.

The natural situation of this city for health is scarcely exceeded by any in the world; and if the inhabitants had been content with the site as nature formed it, I am convinced that the fatal effects of the yellow fever would have been very limited; and even these might have been totally prevented by efficient quarantine laws, carefully and faithfully executed.

From the facts that have been stated, the following conclusions, respecting the cause and progress of the yellow fever, may be drawn.

The air, in some cases, appears to be charged with certain miasmata exhaled from putrescent bodies, which are of a deleterious qua-

lity. Those miasmata, entering into the circulating fluids by means of the lungs, the stomach, or of the absorbent vessels of the skin, operate as a ferment, and produce fever. Some constitutions are more easily affected by these fermentative particles than others; wherefore some persons are unhurt by a portion of corrupted air, which proves deadly to others. Those who are accustomed to any kind of contaminated air, are less affected by it than others. Thus men may accustom themselves, by degrees, to swallow, with impunity, such doses of opium as would occasion almost instant death in those who had not been habituated to this drug.

In all crowded cities the air is contaminated; for it is highly charged with perspirable matter from the lungs and skins of men and beasts. Such an atmosphere, in its dilute state, frequently produces a moderate typhus. When it is more concentrated, or more virulent, it produces what is called the jail fever; and with a little variation in its quality, it produces what is called the yellow fever. It is believed that the perspirable matter, from persons labouring under the yellow

fever, when added to the common contaminated air in small houses, in the narrow streets of large towns, and in warm weather, may prove dangerous to attendants, though it would have been perfectly harmless in the country, or in any other place where it was unassisted by a corrupted atmosphere.

If it be admitted that the yellow fever may be caused by contaminated air, it must also be admitted that this fever may be imported; or, to speak more correctly, the cause of it may be imported. He must be a careless and very inattentive observer, provided his occupation is mercantile, who has not discovered that goods from the hold of a vessel, from a warm climate, in warm weather, are charged with air that appears, by its smell, to be of a quality very different from the surrounding atmosphere. And it must be admitted that goods packed up in a city or port where the yellow fever prevails, are fully saturated with contaminated air; nor can it be supposed that a morbid gas, capable of exciting yellow fever in such port, will be improved or corrected by close confinement in the warm hold of a ship: on the contrary,

its deleterious qualities may be, and no doubt are increased. When goods charged with such a virulent gas happen to be opened in another city, in warm weather, where the air is already contaminated, they may, and perhaps frequently do produce yellow fever or other typhus.

In a word, after all the views we have been able to take of the yellow fever, we are compelled to believe that it may be generated in our own cities, and may be propagated by the medium of impure air; and that the seeds of it, imported from a foreign country, may be cherished and propagated among ourselves by a corrupted atmosphere.

If the yellow fever cannot be generated in the United States, it would follow that there can be little use in removing filth from our streets and wharves, and that cleanliness, which has long since been deemed half a virtue, might safely be neglected. And if that fever be the exclusive production of this country; if, like the West-India hurricanes, it cannot be imported; it would follow that quarantine laws, and all attentions of that kind, are absolutely useless. But if the rea-

sonings we have advanced are well founded, it is evident that cleanliness at home and precaution by sea are equally advisable.

When the source of a disease is known, the means of evading it are more easily discovered; and it is believed the mode adopted by the enlightened corporation of this city will be productive of very salutary effects. They propose, we are told, to fill up the present slips, and give a solid front on the East-river, that shall extend from the Battery to Corlaer's Hook. By this operation the eddy tides will be prevented from leaving putrescent vegetable and animal substances in the slips, which, exposed to the sun at low water, have been volatilized, and have become a fruitful source of the cause of yellow fever among the warehouses and dwellings on the East-river. May those useful citizens persevere in their laudable exertions to remedy and remove nuisances which have imperceptibly crept in among us, and have lately increased to a very destructive degree! May they live to see health and happiness beam in every countenance, as the just reward of their paternal care! Then quarantine laws, which

prevent persons sick of pestilential diseases from entering our city, detain infected merchandize at a distance from our dwellings, and order infected vessels to be perfectly cleansed, will be productive of all the benefits which the most zealous advocates for importation can desire.

It is conceived that much advantage might be derived from an additional improvement on the East-river. Let the surface of the made grounds be covered with a layer of lime five or six inches deep, and let that lime be covered with gravel. It is known that lime is very powerful in destroying such parts of animal and vegetable bodies as are subject to the putrefactive process, which it does by its eager attraction of their constituent principles, and by neutralizing them. Therefore it is presumed that the proposed layer of lime would arrest the ascent of destructive airs, by forming compounds which would possess properties different from those airs in their separate state, and not injurious to the health of man.

FINIS.

COLUMBIA UNIVERSITY LIBRARY

This book is due on the date indicated below, or at the expiration of a definite period after the date of borrowing, as provided by the rules of the Library or by special arrangement with the Librarian in charge.

DATE BORROWED	DATE DUE	DATE BORROWED	DATE DUE
C28(239)M100			

M-RC206

B34

Bayley

An inaug on the
origin an he
yellow fe

COLUMBIA UNIVERSITY LIBRARIES
0050846620